REMARKS

Applicants affirm the election of the tire invention (claims 1-9). The non-elected claims have been canceled, applicants reserving their right to file a continuing application directed to those claims.

The presently claimed invention serves to attract the attention of observers to a tire, e.g., during a tire exhibition. That purpose is achieved by molding onto the outer surface of the tire a design that has on its outer surface at least one light diffraction grating formed by a plurality of ridges or grooves of height H arranged parallel to one another with a period P.

Even though the design is molded onto the tire's outer surface and thus possesses the same black color as the tire, a different color or different colors can be perceived by a viewer due to the coherent light scattering phenomenon produced but by the light diffraction

Claim 1 has been amended to recite that the design is "molded onto the tire" (as opposed to being a separate element affixed to the tire), and to make it clear that the ability of the tire to be visible in at least one color different from the black color is due to the presence of the light diffraction grating.

Original claim 1 was considered obvious over Miyazaki et al. or Hicks et al. taken in view of at least one of Antes, Doner and Wood and further in view of Egan et al.

Miyazaki et al. U.S. Patent 6,235,376 discloses a composite display label as well as a method of forming such a display label on a member, and in particular on a tire. The display label (covered by a protective film) is attached to an unvulcanized tire; then the tire is vulcanized and the protective film is removed (Fig. 3). The

display label can be used as a decoration, or as a means of identification when in the form of a bar code.

Hinks et al. U.S. Patent 4,625,101 discloses a bar code configuration that may be molded onto a tire, and a method for molding it. The bar code configuration has even and uneven surface portions for selectively reflecting light. Diffraction gratings are not mentioned.

Antes U.S. Patent 5,059,776 describes a bar-code field containing bar elements which are engraved with diffraction gratings (see column 6, lines 32-36) so as to make it difficult to copy the article on which the bar-code field is applied (e.g., banknotes -- column 2, lines 20-24). When the bar code is read and decoded, the diffracted light is used to provide information concerning authenticity or classification of the article (column 9, lines 31-35). Gratings on a rubber substrate are not mentioned.

Doner U.S. Patent 1,354,471 discloses a colored design using the diffraction of visible light by gratings formed from a series of parallel lines on a "plane surface of glass, speculum, celluloid, or the like" (column 1, line 54 to column 2, line 60). Rubber is not mentioned. Thus, colored designs may be obtained without the use of paints, pigments or any other means of applying color to the design.

Wood U.S. Patent 3,516,730 discloses ornamental diffraction gratings impressed onto plastic sheet with self-adhesive material disposed on the gratings for ready attachment (Abstract). Rubber surfaces are not mentioned.

Egan et al. U.S. Patent 4,444,713 disclose to vary the finish on respective portions of a tire's outer surface in order to create a visually distinguishable appearance between an indicia portion and a surrounding portion. The finish is

varied by either polishing the area of the mold which produces the indicia portion of the tire, or sandblasting the area of the mold that produces the portion that surrounds the indicia portion. Neither procedure would create a light diffraction grating on the tire. The sandblasting procedure would, a best, produce a roughened surface that performs a diffused light scattering effect.

It is submitted that there is no obvious combination of the base and secondary references which would result in the presently claimed invention. Miyazaki et al. teach away from the presently claimed invention by instructing that the design be made separately from the tire and then attached to the tire, rather than being molded onto the tire as recited in claim 1.

Regarding Hinks et al., aside from the fact that the purpose disclosed therein of providing bar codes on a tire (tire identification) is different from the purpose of presently claimed invention (attention-attracting), Hinks et al. does not disclose diffraction gratings, and it would not have been obvious to replace the saw tooth ribs of Hinks et al. with diffraction gratings since Hinks et al. uses the ribs to create bar codes which have precise shapes and dimensions.

Moreover, Hinks et al. states at column 2, line 55 to column 3, line 28, that the information contained in the bar code is gathered by means of an optical device, taking advantage of act that the even and uneven surfaces of the bar code reflect light differently. The skilled person would, therefore, wish to keep the even surfaces even and not add gratings which would introduce diffraction effects that might be more difficult to interpret. In other words, to add a diffraction grating might make the analysis of the scattered light signal more complex.

Actually the fact that a diffraction grating can be molded on a tire sidewall to produce a color effect is quite surprising, even the size of the components of the rubber compositions (mixes), in particular the reinforcing filler (see paragraph 012 of the present specification). Moreover, the black rubber material is known to be strongly light absorbing, which suggests that scattering is reduced. It is not seen that a person skilled in the tire art would have considered molding, into a tire, structures as fine as bar codes.

The Antes patent relates to the field of apply bar codes to items such as banknotes to make it difficult to copy the items. That purpose (to prevent copying) is completely unrelated to the tire field to which the base references are directed (tires are not copied in the manner of banknotes). That fact, plus the materials on which Antes intends to provide copy-preventing bar codes (documents) is markedly dissimilar from the rubber material of which the tires of Hinks et al. and Miyazaki et al. are formed, makes it unlikely that an artisan in the field of tires would find the Antes patent of interest.

Likewise, the Doner and Wood patents relate to the formation of patterns on materials considerably diverse from rubber (Doner discloses glass, speculum, and celluloid; and Wood discloses plastic sheet) and it is not seen that an artisan in the tire field would find such patents of interest. Note also that Wood discloses to attach the designs to the material rather than molding them onto the material as presently claimed.

As regards Egan et al., the Official action states that:

> "the surface finishes [of Egan et al.] are considered very analogous to those produced by the diffraction gratings (i.e., both resulting from essentially micrcoscopic pattering) and thus would be instructive to the artisan in adapting or adopting gratings in the tires."

Applicants disagree with that characterization. In Egan et al. the optical contrast is obtaining by varying the capacity of the rubber to produce diffuse light scattering. It could be compared to the optical contrast of a mirror fixed to a wall covered with rough wallpaper: the mirror does not scatter diffusely whereas the wallpaper does. On the other hand, the presently claimed invention uses coherent light scattering that is very different from diffuse light scattering. Even though the dimensions involved overlap (Egan et al. mention surface finishes between 10 and 250 micro-inches [about 0.25 to 6 mu]; the disclosed invention involves values less than 1 mu [40 micro-inches]), in the case of a grating there are striations that have to be perfectly well aligned. Egan et al. need a dull surface (col. 2, lines 34-36) and, therefore, would avoid as much as possible the regular striations of a diffraction grating which aim at uniform light scattering.

For the above reasons, it is submitted that it would not have been obvious to mold a diffraction grating into the tires of Hinks et al or Miyazaki et al. Allowance of claim 1 and dependent claims 2-9 is respectfully requested.

In light of the foregoing, it is submitted that the application is in condition for allowance and such allowance is respectfully solicited.

Respectfully submitted,

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